

## ABSTRACT

A large aperture, high spatial resolution vibration and acoustic sensing device is provided. The sensor is capable of directional resolution of acoustic sources in gaseous, liquid, and solid media, and can be employed as a directional microphone or a directional hydrophone. The sensor can also be used as a high-resolution vibration displacement sensor. The device is formed of thin films comprising two electret layers and a compliant intermediate layer disposed therebetween. Conductive coatings disposed on the electret layers can be patterned and etched to provide a plurality of discrete sensing elements, forming a directional array. The sensor can be transparent, thereby allowing usage as a large area microphone disposed on top of a computer screen, video monitor, windows, or walls.